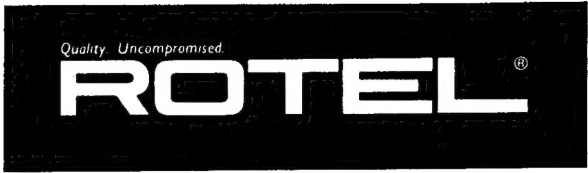


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Technical Manual

NON-SWITCHING DC SERVO STEREO INTEGRATED AMPLIFIER RA-700

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Serial No. Beginning
NE16311

THE ROTEL CO., LTD.
ROTEL ELECTRONICS CO., LTD.
ROTEL OF AMERICA, INC.
ROTEL HI FI LIMITED.

1-36-8 OHOKAYAMA, MEGURO-KU, TOKYO 152 JAPAN
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BUCKINGHAMSHIRE, ENGLAND

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Alignment

Instruments: Oscilloscope, DC millivoltmeter

POWER AMP SECTION

A. DC Balance Adjustment

1. Set vertical gain control of the oscilloscope to 0.1V/cm, and vertical input switch to GND. Bring the trace to central position on the screen; then set the vertical input switch to DC position.

Before making adjustment, short-circuit pin E6 to pin TP3 (TP-4 for R-ch) on H-AF-119 p-c board, to avoid servo effect. (Fig. 1)

2. Connect the oscilloscope to pin TP3 (TP4 for R-ch) on main amp p-c board. Set volume control of the amplifier to minimum position. Turn on the power. When DC output appears on the screen (the trace will shift upwards or downwards as shown in Fig. 1), adjust potentiometer VR401 (VR402 for R-ch) on H-AF-119 p-c board so that the DC voltage present at the test point is 0V±50mV.

After completing adjustment, disconnect the ground connection of TP terminal.

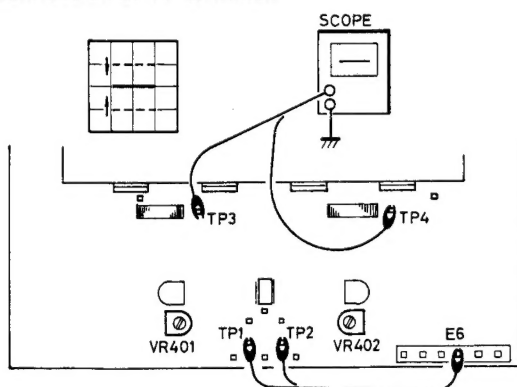


Fig. 1

B. Bias (Idling Current) Adjustment

1. Connect the plus lead of DC millivoltmeter to TP5 (TP6 for R-ch) on H-AF-119 and the minus lead to TP3 (TP4 for R-ch). Set volume control to minimum position. Turn on the power.
2. Adjust potentiometer VR403 (VR404 for R-ch) on H-AF-119 p-c board so that the DC millivoltmeter reads 10mV.

PHONO SECTION

DC Balance Adjustment

1. Set vertical gain control of the oscilloscope to 0.1V/cm, and vertical input switch to GND. Bring the trace to central position on the screen; then set the vertical input switch to DC.

Before making adjustment short-circuit pin 1 (pin 2 for R-ch) to pin E on PR-123 p-c board, to avoid servo effect. (Fig. 3)

2. Connect the oscilloscope to pin 3 (pin 4 for R-ch) and pin E. Set Function Selector to PHONO (MC) position and volume control to minimum. Turn on the power.

When DC output appears on the screen (the trace will shift upwards or downwards as shown in Fig. 3), adjust potentiometer VR101 (VR102 for R-ch) on PR-123 p-c board so that the DC voltage present at

Alignement

Instruments: Oscilloscope, millivoltmètre CC

SECTION AMPLI DE PUISSANCE

A. Réglage d'équilibrage CC

1. Régler la commande de gain vertical de l'oscilloscope sur 0,1 V/cm et la commande d'entrée verticale sur GND. Amener la trace en position centrale sur l'écran; amener ensuite la commande d'entrée verticale sur la position CC. Avant d'effectuer ce réglage, court-circuiter la broche E6 et la broche TP3 (TP4 pour le canal de droite) sur la plaquette de circuit imprimé H-AF-119 afin d'éviter l'effet de rétroaction (Fig. 1).
2. Brancher l'oscilloscope sur la broche TP3 (TP4 pour le canal de droite) sur la plaquette du circuit d'amplification principal. Régler la commande de volume de l'ampli sur la position minimum. Mettre sous tension. Lorsque la sortie CC apparaît sur l'écran (la trace est décalée vers le haut ou vers le bas comme illustré sur la Fig. 1), ajuster le potentiomètre VR401 (VR402 pour le canal de droite) sur la plaquette H-AF-119 de façon à ce que la tension CC observée sur le point de mesure soit de 0 V±50 mV. Une fois le réglage terminé, débrancher le circuit de mise à la masse de la borne TP.

B. Réglage de polarisation (courant déwatté)

1. Brancher le fil plus du millivoltmètre CC sur la broche TP5 (TP6 pour le canal de droite) de H-AF-119 et le fil moins sur TP3 (TP4 pour le canal de droite). Régler le volume au minimum. Mettre sous tension.
2. Ajuster le potentiomètre VR403 (VR404 pour le canal de droite) sur la plaquette H-AF-119 de façon à ce que le millivoltmètre affiche 10 mV.

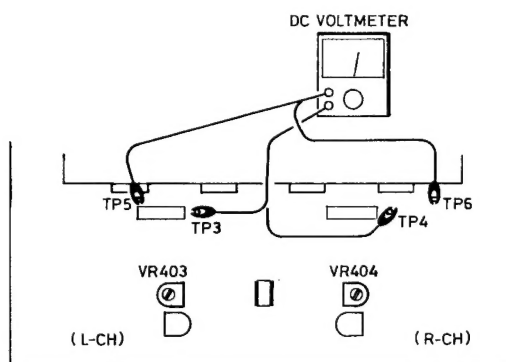


Fig. 2

SECTION PHONO

A. Réglage d'équilibrage CC

1. Régler la commande de gain vertical de l'oscilloscope sur 0,1 V/cm et la commande d'entrée verticale sur GND. Amener la trace en position centrale sur l'écran puis régler la commande d'entrée verticale sur CC. Avant d'effectuer ce réglage, court-circuiter la broche 1 (broche 2 pour le canal de droite) et la broche E sur la plaquette PR-123 afin d'éviter l'effet de rétroaction (Fig. 3).
2. Brancher l'oscilloscope sur la broche 3 (broche 4 pour le canal de droite) et la broche E. Amener le sélecteur de fonction sur la position PHONO (MC) et la commande de volume au minimum. Mettre sous tension. Lorsque la sortie CC apparaît sur l'écran (la trace est décalée vers le haut ou vers le bas comme illustré sur la Fig. 3), ajuster le potentiomètre VR101 (VR102

pin 3 (pin 4 for R-ch) is $0V \pm 50mV$.
After completing adjustment, disconnect the ground connection of TP terminal.

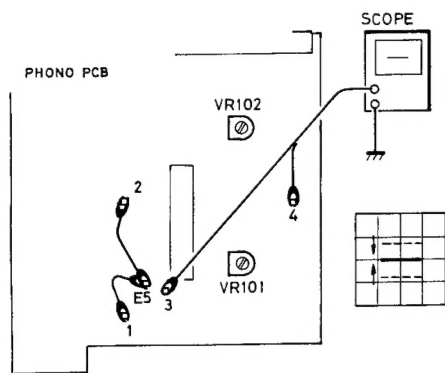


Fig. 3

ADDENDA

1. Circuit pattern and connection of the units with serial number up to NE16361 are slightly different from the ones given in this booklet.
2. Numbering of test points differs:
TP3 and TP4 on this booklet are identical to TP9 and TP10 on the units with serial number up to 16361 respectively.

ADDENDA

1. La forme des circuits et le branchement sur les unités portant un numéro de série inférieur à NE16361 sont légèrement différents des indications du présent manuel.
2. La numérotation des points de mesure est différente: TP3 et TP4 du présent manuel correspondent à TP9 et TP10 sur les unités dont le numéro de série est inférieur à 16361.

Specifications Caractéristiques

Continuous Power Output . . .	.40 watts* per channel, min. RMS both channels driven into 8 ohms from 20 to 20,000Hz with no more than 0.009% total harmonic distortion.
Total Harmonic Distortion. . .	No more than 0.009% (continuous rated power output) No more than 0.005% (continuous 1/2 rated power output) No more than 0.01% (1 watt per channel power output, 8 ohms)
Intermodulation Distortion . .	No more than 0.009% (continuous power output) No more than 0.009% (continuous 1/2 rated power output) No more than 0.01% (1 watt per channel power output, 8 ohms)
Output: Speaker	A, B (8-16 ohms), A (8-16 ohms) + B (8-16 ohms)
Headphone.	8-16 ohms
Damping Factor. . . . .	.55 (20 to 20,000Hz, 8 ohms)
Input Sensitivity/Impedance:	
PHONO (MC) . . . . .	.02mV/100 ohms
PHONO (MM). . . . .	.25mV/47 kohms
TUNER, AUX. . . . .	.150mV/39 kohms
TAPE MONITOR 1, 2 . . .	.150mV/39 kohms
Overload Level (T.H.D. 0.1%, 1kHz):	
PHONO (MC) . . . . .	.38mV
PHONO (MM). . . . .	.390mV
AUX . . . . .	.5V

Frequency Response:

PHONO	20 to 100,000Hz, $\pm 0.5dB$ (RIAA STD)
AUX5 to 70,000Hz, $+0.0dB, -1.0dB$

Tone Control:

Graphic Equalizer.40, 90, 200, 450, 1k, 2.5k, 6.5k, 16kHz $\pm 12dB$
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Loudness Contour	+10dB (100Hz), +4dB (10Hz) (volume control set at -40dB position)
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Signal-to-Noise Ratio (IHF, A network):

PHONO (MC)66dB
PHONO (MM).87dB
TUNER, AUX.98dB
TAPE MONITOR 1, 298dB

Subsonic Filter	-3dB/16Hz
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MISCELLANEOUS

Power Requirement.	120V/60Hz, 220V/50Hz, 240V/50Hz, or 120, 220, 240V/50-60Hz (switchable)
Power Consumption . . . . .	.250 watts
Dimensions (overall) . . . . .	.430 (W) x .91 (H) x .293 (D) mm 16-15/16" x 3-9/16" x 11 1/2 "
Weight (net) . . . . .	.72kg/15.9 lbs

- Specifications and design subject to possible modification without notice.
- *Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Claims for Amplifiers (applicable to the U.S.A. only).

Parts List Liste des pièces

Schematic Location	Description	Part No.
TRANSISTORS, DIODES AND IC'S		
Q101, 102, 111, 112, 186, 249, 250, 253, 254, 257, 258, 261, 262, 265, 266, 269, 270, 273, 274, 277, 278, 401, 402, 413, 414, 512	2SA608KNP (F,G)	301001193
Q103 to 106, 241 to 244, 403 to 406	2SC1570 (G,H)	301201242
Q107 to 110, 201, 202, 407, 408, 409, 410	2SK163 (K)	302001134
Q113, 114, 119, 120, 245, 246, 415, 416, 421, 422, 441, 442	2SA1016 (G, H)	301001194
Q115 to 118, 247, 248, 419, 420, 429, 430, 431, 432, 443, 513,	2SC2362 (G, H)	301201241
Q121, 122, 433, 434	2SD600 (E, F)	301301150
Q123, 124, 435, 436	2SB631 (E, F)	301101134
Q181, 184	2SK246 (GR)	302001132
Q182	2SC1984 (O, Y)	301201170
Q183, 251, 252, 255, 256, 259, 260, 263, 264, 267, 268, 271, 272, 275, 276, 279, 280, 411, 412, 417, 418, 511, 514, 515	2SC536KNP (F, G)	301201236
Q185	2SA919 (F, G)	301001192
Q187	2SA913 (Q, R)	301001143
Q423, 424, 427, 428	2SA1019 (E, F)	301001195
Q425, 426,	2SC2375 (E, F)	301201243
Q437, 438	2SC2578 (Q, Y)	301201235
Q439, 440	2SA1103 (Q, Y)	301001190
D101 to 110, 401 to 406, 409 to 424, 511	MA150 (Si)	300111016
D111, 112	KB-269, Varistor	300212004
D181 to 183	WZ-140, Zener, 14V, 0.5W	300313018
D407, 408	SV-04S, Varistor	300212010
D531	RB-602, Rectifier	300919047
D532	KBP-02, Rectifier	300919027
D533	SR1K4, Rectifier	300919024
D534	WZ-120, Zener, 12V, 0.5W	300313013
D001, 006, 007	GL-9PR24, LED, (RED), Power, Tape, Ind	300414048
D002 to 005	GL-9NG24, LED, (GRN), Func, Ind	300414049
IC101, 401	NJM4558D	303452215
VARIABLE RESISTORS		
VR101, 102	100B, Pot, Phono DC Bal Adj	510502208
VR201	100kB x 2, Volume Control	525121152
VR202	250KW x 2, Balance Control	581005059
VR361 to 368	100KW x 2, Acoustic Control	581005058

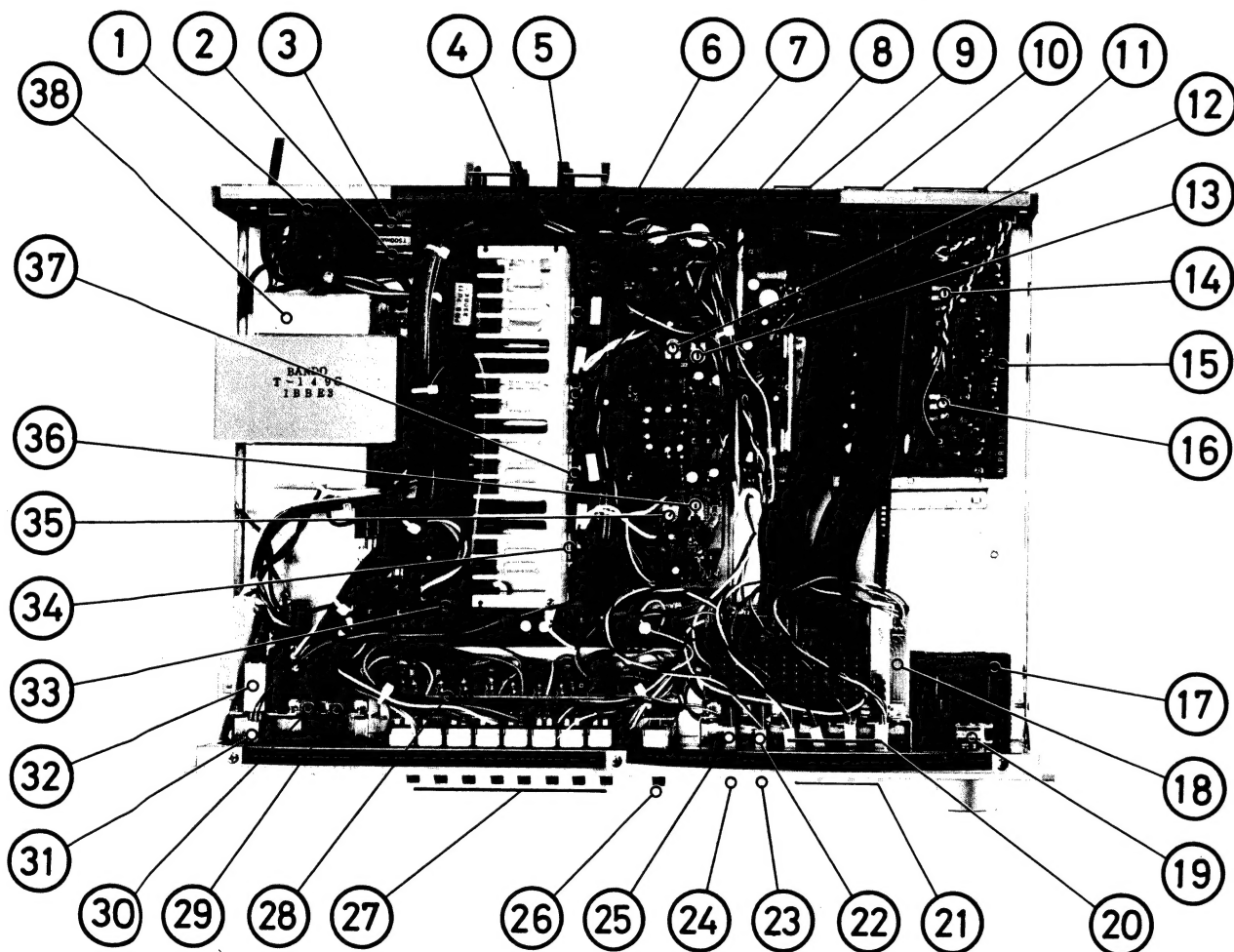
Schematic Location	Description	Part No.
VR401, 402	300B, Pot, Main DC Bal Adj	510502187
VR403, 404	10KB, Pot, Bias Adj	510502186
OTHERS		
L401, 402	Coil, Antiparasitic	228641126
T001	Power Transformer, "Type G"	207001528
	Power Transformer, "Type D"	204001528
RY511	Relay, Protection	240111251
S101	Switch, Remote, Phono MC/MM	615212298
S1 to 3 (1 Set)	Switch, Push 6-key, Func Selector, etc.	614051217
S4 to 7 (1 Set)	Switch, Push 4-key, Loudness, Mode, etc.	614040841
S8, 9 (1 Set)	Switch, Push 2-key, Speakers	614020451
S10	Switch, Push 1-key, Power	614010165
F531*1	Fuse, 3.5A, (Pri), for 120V Area	341222350
F532, 533	Fuse, 5A, (Sec), for 120V Area	341222500
	Fuse, T5A, (Sec), for 220/240V Area	345952500
F534, 535	Fuse, 1A, (Sec), for 120V Area	341222100
	Fuse, T500mA, (Sec), for 220/240V Area	345952050
C551	Noise Canceller, NSK-135, for 120V Area	470101118
	PME265MB522, for 220/240V Area	470101136
	Preamplifier & Graphic & EQ P-c Board Ass'y	141510184
	Main Amplifier & Power Supply P-c Board Ass'y	141610351
	Pin Jack, 6P, Phono, Tuner, AUX Input	624302206
	Pin Jack, 4P, Tape In/Out	624303204
	Speaker Terminal Board	649201123
	Phone Jack	626110037
	Voltage Selector	648211247
	Fuse Clip, ϕ 6.35	648211257
	Fuse Clip, ϕ 5.2	648211256
	LED Socket w/Wire (RED/BLK), L=200mm	648211284
	LED Socket w/Wire (ORG/BLK), L=200mm	648211285
	LED Socket w/Wire (YLW/BLK), L=200mm	648211286
	LED Socket w/Wire (GRN/BLK), L=200mm	648211287
	LED Socket w/Wire (BLU/BLK), L=200mm	648211288
	LED Socket w/Wire (PPL/BLK), L=200mm	648211289
	LED Socket w/Wire (BRN/BLK), L=300mm	648211292
	Flex Wire Ass'y	647110017
	Power Cord, for U.S.A., etc.	796301115
	Power Cord, for Europe	796301148
	Power Cord, for UK	796301138
	Cord Stopper, U.S.A., Europe, etc.	675201114
	Cord Stopper, UK	675201116
	Cover, Power SW	792011219
	Cover, Noise Canceller*2	792011220
	Cover, Voltage Selector	792011218
	Front Panel Ass'y	111911572
	Top Cover	138011324
	Knob, Volume	116310351
	Knob, Balance, etc.	116310310
	Button, Loudness, Mode, etc.	116210104
	Button, Func, Power, etc.	116210092
*1: Not used on the unit for 220/240V area.		
*2: Not used on the unit for 120V area.		

(A) SPEAKER TERM. (B)

Schematic Location	Description	Part No.
Foot		673402027
Screw, M3 x 6 (Ni) Bind		705213006
Screw, M3 x 12 (Ni), Bind		705213012
Screw, M3 x 4 (Ni), Bind		705213004
Screw, M3 x 8 (BLZ), Bind		705223008
Screw, M3 x 6 (Ni), Ovalcountersunk		702213006
Screw, M4 x 8 (BLZ) w/FW, Bind		755224008
Screw, TP3 x 10 (Ni)		726213010
Screw, TP3 x 8 (Ni)		726213008
Screw, TP3 x 10 (BLZ)		726223010
Screw, TP3 x 8 (BLZ)		726223008
Screw, TP3 x 8 (Ni), Ovalcountersunk		722213006

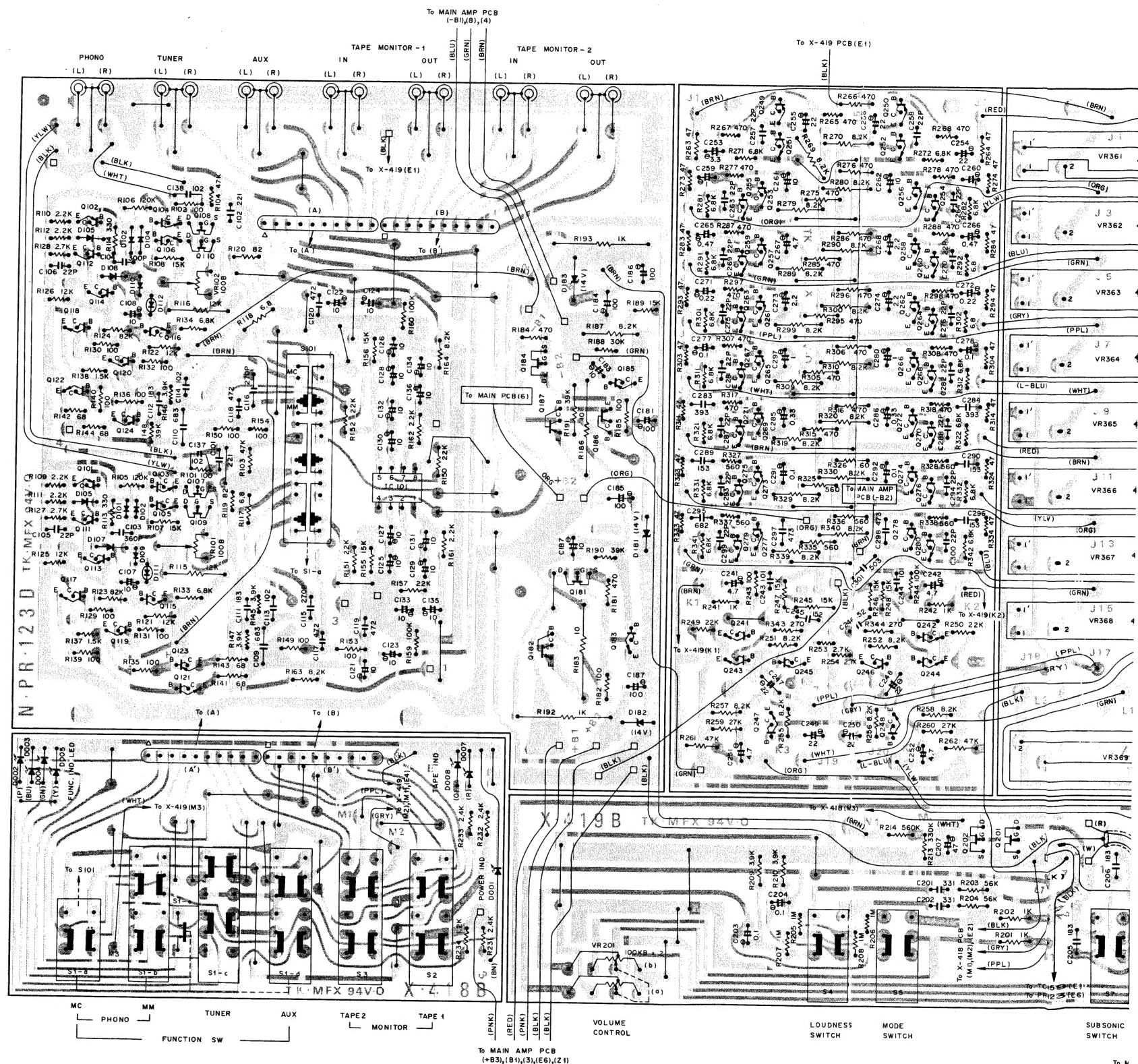
Schematic Location	Description	Part No.
Screw, Tap-tight 4 x 10		765214010
Washer, Plain M3		770500003
Washer, Spring M3		770500010
Washer, Spring M4		770500011
Washer, Plain M7		770500006
Nut, M3, Square, Tr Mtg.		770911144
Nut, M4, Hex		770402202
Nut, M7, Hex		770402205
Stopper, Phone Jack		770911278
Spacer, M3, L=8mm		770911301
Insulation Collar, Tr Mtg.		992001111

Chassis Layout (Top View) Installation du châssis (vue de dessus)

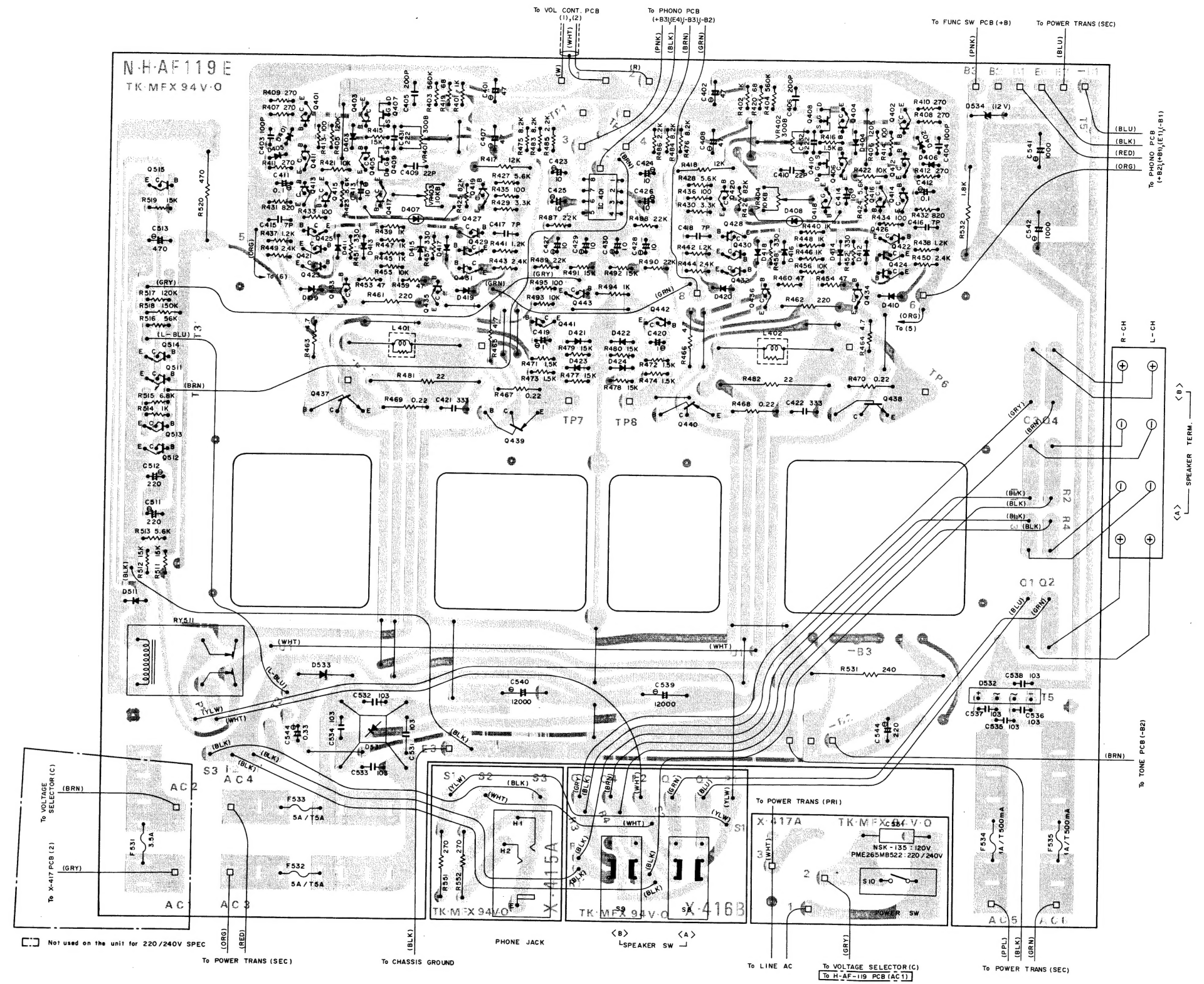
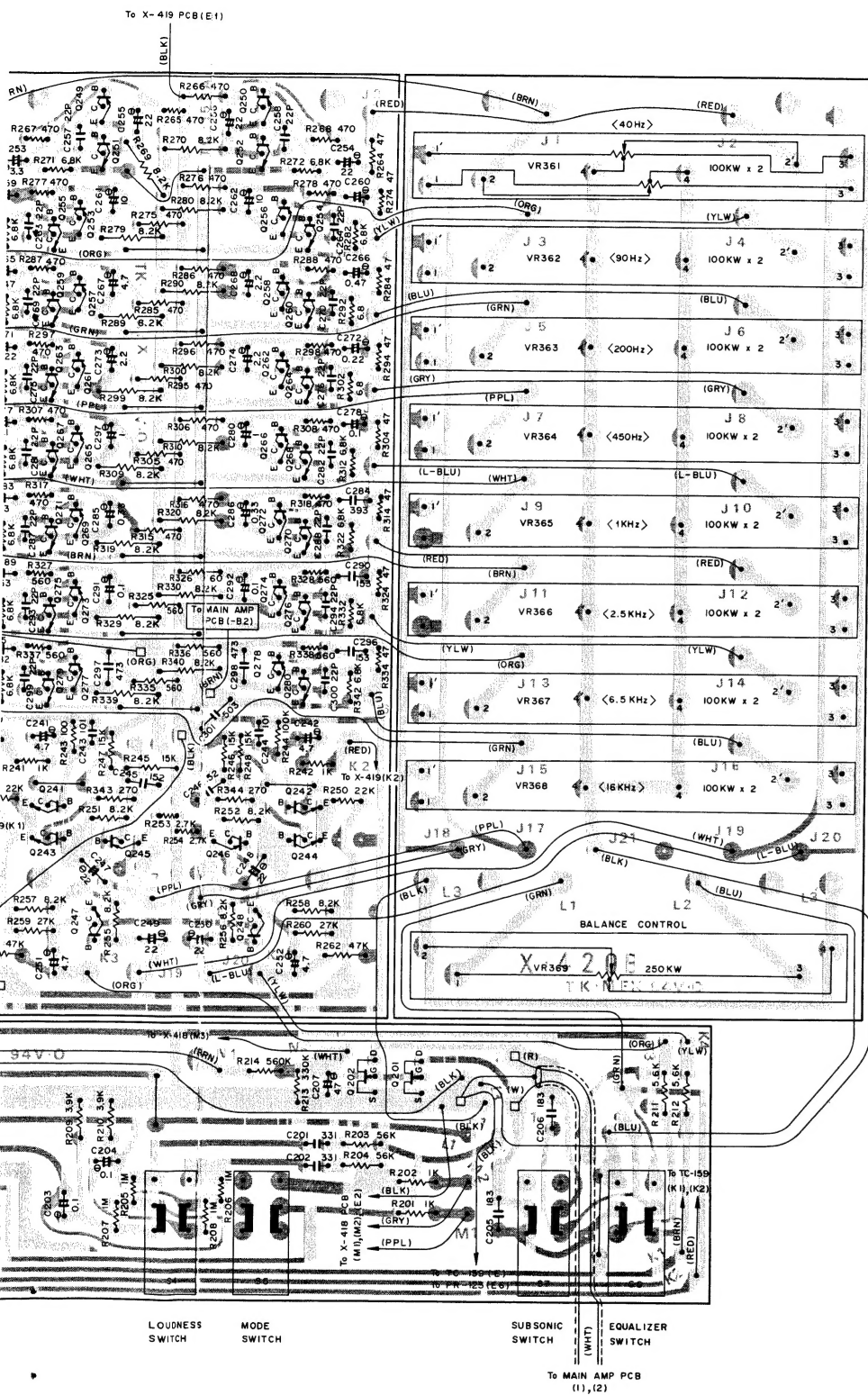


1. VOLTAGE SELECTOR
2. F534, FUSE
3. F535, FUSE
4. SPEAKER 'A' TERMINALS
5. SPEAKER 'B' TERMINALS
6. MAIN AMP AND POWER SUPPLY P-C BOARD
7. Q438, R-CH POWER TRANSISTOR
8. Q440, R-CH POWER TRANSISTOR
9. TAPE MONITOR-2 JACKS
10. TAPE MONITOR-1 JACKS
11. INPUTS JACKS
12. VR404, R-CH IDLING (BIAS) CURRENT ADJ
13. VR402, R-CH MAIN AMP OFF-SET (DC BALANCE) ADJ
14. VR102, R-CH PHONO AMP OFF-SET (DC BALANCE) ADJ
15. PHONO AMP P-C BOARD
16. VR101, L-CH PHONO AMP OFF-SET (DC BALANCE) ADJ
17. VOLUME CONTROL AND MUTING P-C BOARD
18. FUNCTION SELECTOR P-C BOARD
19. VOLUME CONTROL
20. FUNCTION INDICATOR
21. FUNCTION SELECTOR
22. TAPE-2 INDICATOR
23. TAPE-2 SWITCH
24. TAPE-1 SWITCH
25. TAPE-1 INDICATOR
26. BALANCE CONTROL
27. ACOUSTIC CONTROLS
28. EQUALIZER P-C BOARD
29. SPEAKER 'B' SWITCH
30. SPEAKER 'A' SWITCH
31. POWER INDICATOR
32. POWER SWITCH
33. PROTECTION RELAY
34. Q437, L-CH POWER TRANSISTOR
35. VR403, L-CH IDLING (BIAS) CURRENT ADJ
36. VR401, L-CH OFF-SET (DC BALANCE) ADJ
37. Q439, L-CH POWER TRANSISTOR
38. T001, POWER TRANSFORMER

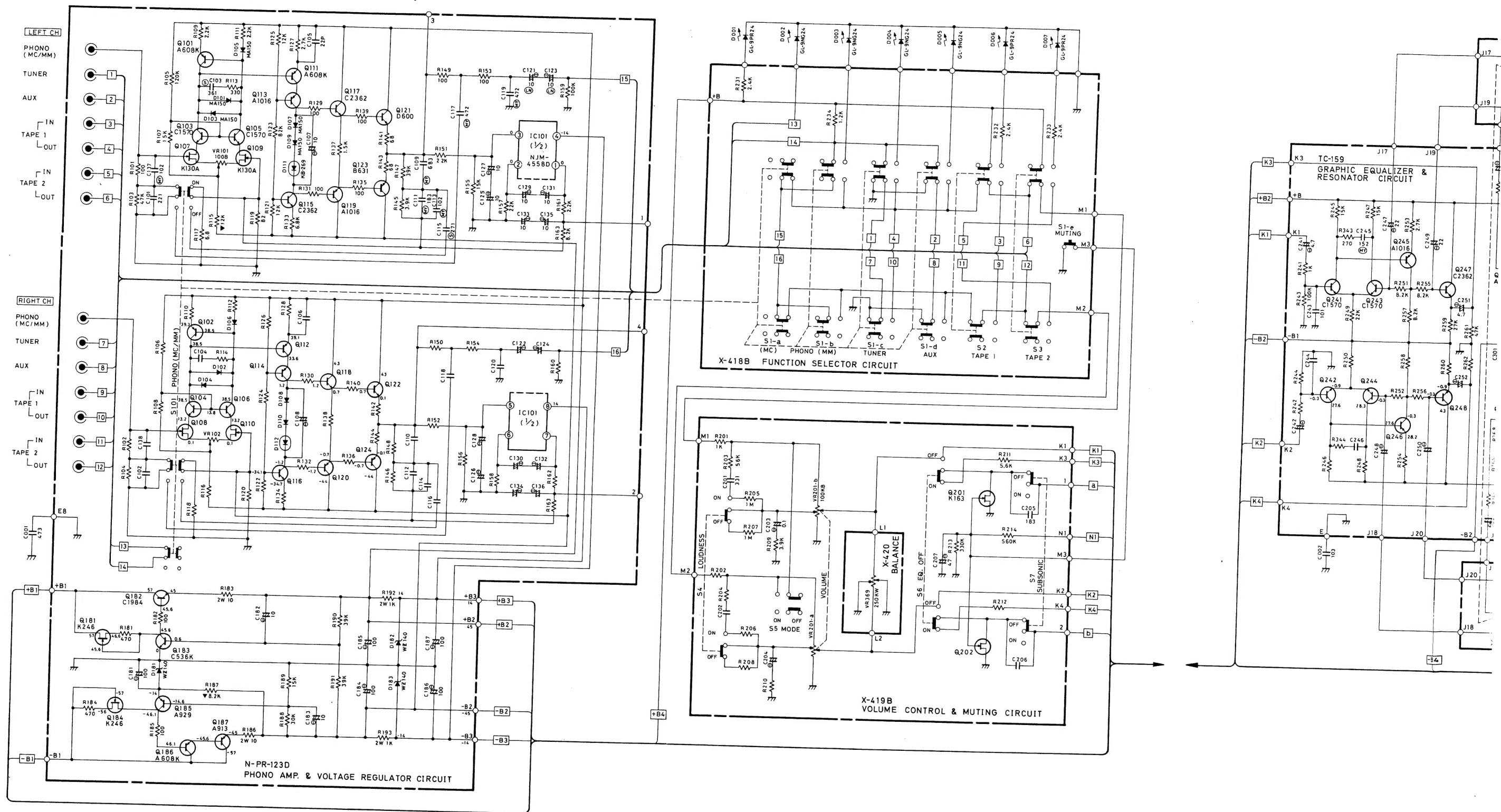
PREAMPLIFIER AND EQUALIZER CIRCUIT CIRCUIT DE PREAMPLI/D'EGALISEUR



MAIN AMP AND POWER SUPPLY CIRCUIT CIRCUIT D'AMPLI PRINCIPAL/D'ALIMENTATION

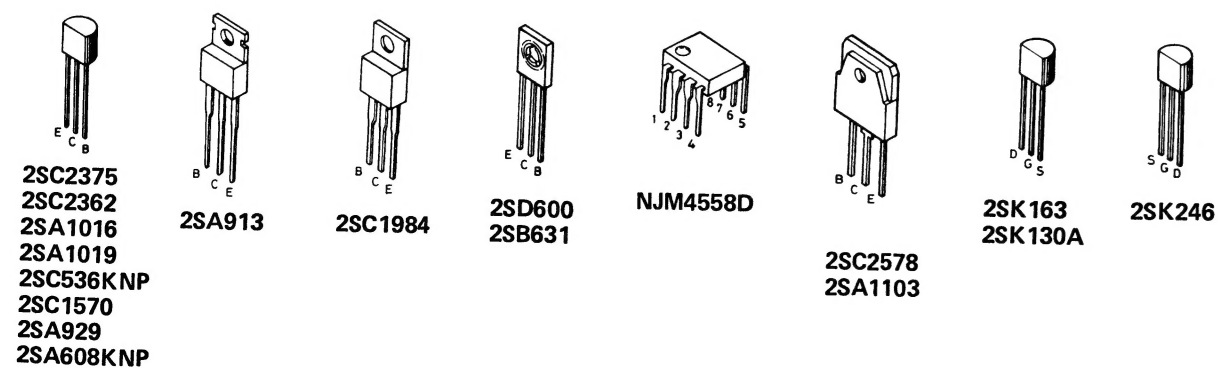


Schematic Diagram Diagramme schématique



RA-700 (NO.1)

RA-700 (N



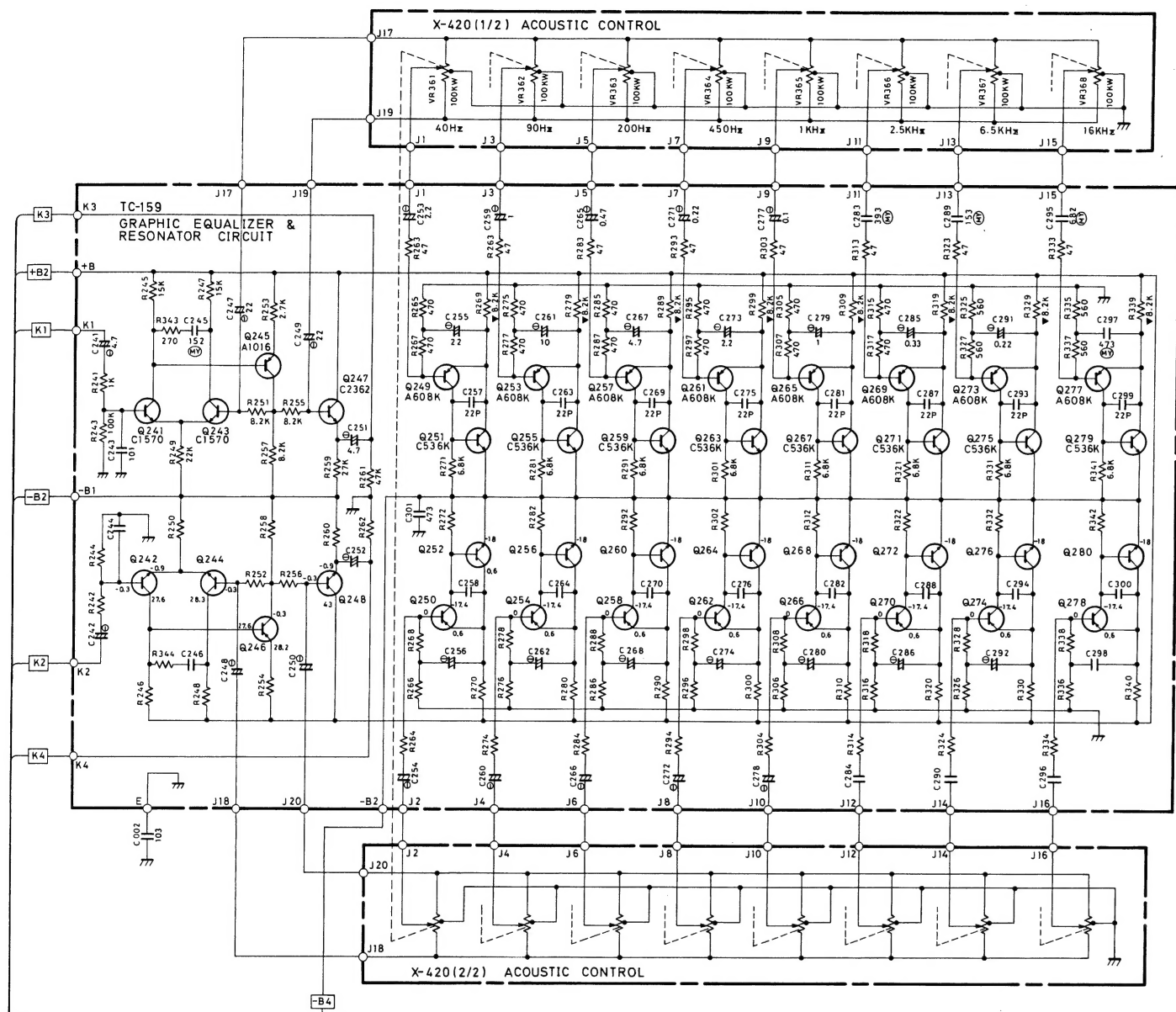
RESISTORS

Unless otherwise specified, resistors are 1/4 watts, low noise type carbon film type with a tolerance of 5%
 K Kilohm
 M Megohm
 ▼ Unflammable carbon film resistor, 1/2 watts

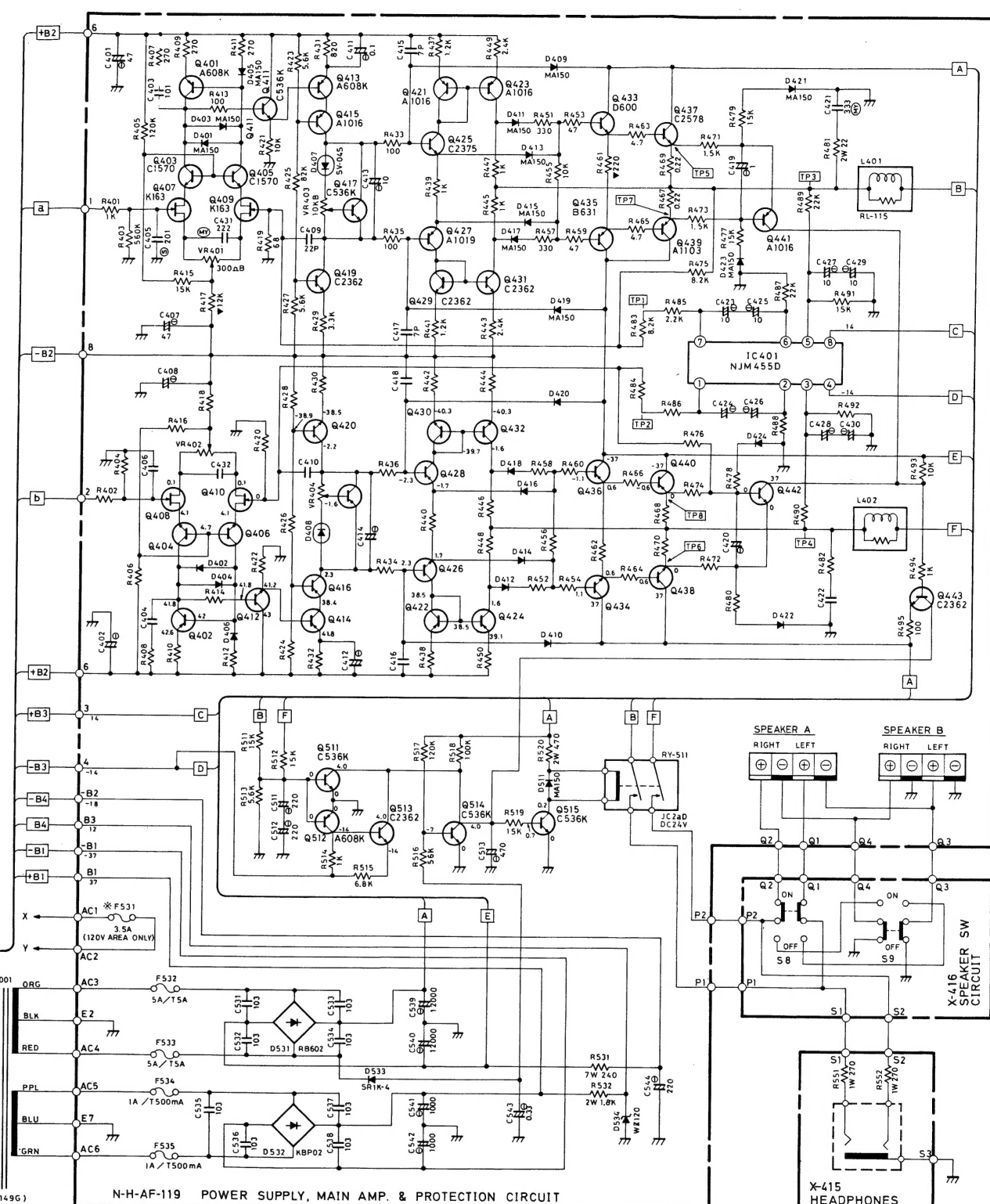
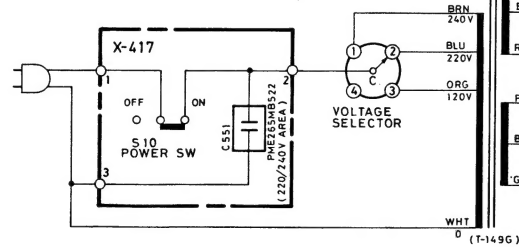
CAPACITORS

Unless otherwise specified, all capacitance values are expressed in mfd.
 S Polystyrene film capacitor
 MY Mylar film capacitor
 — Electrolytic capacitor
 Non mark Ceramic capacitor

- Voltage read with VTVM across the point shown and the chassis ground (line voltage: 120V)
- Voltage reading tolerance: $\pm 20\%$



RA-700 (NO.2)



specified, all capacitance values are
 styrene film capacitor
 r film capacitor
 electrolytic capacitor
 mic capacitor
 h VTVM across the point shown and
 d (line voltage: 120V)
 tolerance: ±20%